

# B R E V I O R A

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### SYSTEMATIC AND OTHER NOTES ON SOME OF THE SMALLER SPECIES OF THE ANT GENUS RHYTIDOPONERA MAYR

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The following notes concern a few species belonging to the *impressa* and *metallica* groups of the genus *Rhytidoponera* Mayr. These forms have been included by most recent authors in *Chalcoponera* Emery, but I have shown (Brown, 1953, *Breviora*, No. 11, p. 2) that Emery's group cannot be separated generically, or even subgenerically, from *Rhytidoponera*. The present problem consists simply of recognizing the specific groupings in question by means of their external characters, chiefly utilizing the workers for study objects, and making the appropriate synonymic reductions. The salient characters will be given briefly and informally with a view toward rendering identification more rapid and certain than has heretofore been possible.

Cabinet investigation is based upon material in the Museum of Comparative Zoology at Harvard University, most of which was gathered in Australia by Prof. W. M. Wheeler, or through his correspondents and contemporary colleagues, and by myself during the course of a recent year-and-a-half stay in Australia under the auspices of the United States Educational (Fulbright) Foundation and of the Parker Fellowship Fund of Harvard University.

Other papers on various groups of *Rhytidoponera*, intended to follow this pattern, are under preparation.

## GROUP IMPRESSA

This closely interrelated series of forms comprises *R. impressa* (Mayr) and its erstwhile varieties with their synonyms. *R. aenescens* Emery of New Guinea may also belong in this group, but no specimens have been examined for the present work. The Australian fauna contains three species of the group as far as known, all similar in general details of structure, and all of similar size. The body is slightly larger than in most members of the more common *metallica* group, and generally more slender. The head is only slightly longer than broad, and the occipital lobes or "ears" are much less perfectly developed than in *metallica*, so that in direct dorsal cephalic ("full face") view, the occipital border appears approximately straight or even feebly convex. In lateral view, the weakly developed occipital lobes are seen as lamellate flanges, the sharpness of curvature of which affords a good species criterion (see below). Most characteristic of the group is the gently but distinctly constricted or "saddled" alitrunk as seen from the side. This formation is due to a concavity or gradually rounded stepping in the region of the posterior mesonotum and anterior propodeal dorsum. The legs and antennae are longer and more slender than in *metallica*, in keeping with the more rapid locomotion of the *impressa* group species.

Distribution, as known, runs from New Guinea down along the mountain chains paralleling the eastern Australian coast. The normal habitat is rainforest or, in the southern part of the range in Victoria, in moist or wet sclerophyll (eucalypt-dominated) forest. The nests are usually built in rotten logs or sticks lying on the forest floor, but in areas where rotten wood is not available, *R. chalybaea* at least will nest directly in the soil or beneath rocks.

When the nest is breached, the workers scatter rapidly and hide; some workers will feign death, but not as readily nor for so long a time as in the case of *metallica*. The colonies are small, generally containing 30 to 250 workers and one dealate queen, but mature nests will often produce large broods of winged males and females. Sexual brood production occurs during the end of the rainy season, and circumstantial evidence indicates that a normal nuptial flight commonly occurs during the first part of

the dry season, even though rainy seasons are virtually opposite in the northern and southern parts of Australia. Isolated nest-founding queens are found in conditions resembling those of the usual ant nest-formation pattern throughout the respective dry seasons in the different parts of the range. The *impressa* group species, along with just a few other forms (probably including *R. aspera* and *R. croesus*), are exceptional among *Rhytidoponera* groups in the "normality" of their production of both sexual forms unidally and with apparently clear-cut periodicity, and their method of nest foundation through normal, fertile, dealate females. Most other species of the genus appear to deviate from this pattern considerably, and in these forms, which often seem to lack entirely a distinguishable female caste, the method of nest foundation is still unknown.

In studying fairly abundant material of this group from a wide range of localities, I could distinguish only three species in the continental Australian fauna, one of which also occurs in New Guinea. The three Australian species, at least from the present material, appear to replace one another from north to south in the narrow eastern "wet strip" with very slight geographical overlap. Applying the prior names for these populations, we find *R. purpurea* Emery in New Guinea and in the rainforests of the Cairns-Atherton Tableland area of North Queensland, *R. impressa* (Mayr) beginning on the southern part of the Atherton Tableland and occurring at various intermediate points southward to the vicinity of Brisbane, in southeastern Queensland, and *R. chalybaea* Emery, starting probably in the region just north of Brisbane on the mountaintops and ranging south at least to Melbourne in south central Victoria. Though the characters are rather slight for the separation of *purpurea* from *impressa*, they appear to be discontinuous together, and I have little doubt that they delimit two distinct species.

*R. chalybaea*, on the other hand, seems to be distinguishable from *impressa* only on the basis of coloration, and a rather tenuous and cabinet-labile metallic coloration at that. At the present writing, the possibility still exists that these two forms are mere geographical variants of the same species, although at Montville, in the Blackall Range, about 50 or 60 miles north of Brisbane, typical blue *chalybaea* were found nesting under rocks on the

cleared top of the ridge, while only a few hundred feet below in the rainforest, I consistently took only the brown typical *impressa*. One series, however, coming from the environs of Brisbane, showed the brown color of *impressa* with just the feeblest hint, at high magnifications, of bluish metallescence. I do not attach special significance to this series because it is an old collection and may have undergone a change in the structural and pigmental coloration. All collections from the small remaining part of southeastern Queensland to the south of Brisbane have proven to be of the typical blue *chalybaea*, and I can testify that the population on Tambourine Mountain, only some 40 miles south of Brisbane, is uniformly of blue color. It is obvious that the populations inhabiting the scattered rainforest patches close to Brisbane require further study in order to settle this question finally, and it is fortunate that these are so readily accessible.

#### RHYTIDOPONERA CHALYBAEA Emery. New status

*Rhytidoponera impressa* var. *chalybaea* Emery, 1901, Ann. Soc. Ent. Belg.,

45: 51, worker. Type locality: New South Wales.

*Ectatomma* (*Rhytidoponera*) *cyrus* Forel, 1910, Rev. Suisse. Zool., 18: 13, worker, female. Type locality: Ballina, New South Wales, (W. W. Froggatt). **New Synonymy.**

*Rhytidoponera* (*Chalcoponera*) *cyrus*, Emery, 1912, Deutsch. ent. Zeitschr., p. 81, discussion of worker characters and relationships.

*Rhytidoponera* (*Chalcoponera*) *aspera* var. *scabrior* Crawley, 1925, Ann. Mag. Nat. Hist., (9) 16: 590, worker. Type locality: Lismore, New South Wales (Deuquet). **New Synonymy.**

This, the southern representative of the *impressa* group in Australia, is metallic blue or purplish-blue in color, with the gaster matching the head and alitrunk, but usually slightly duller. Legs and antennae light to sordid ferruginous, contrasting strongly with the body color, especially so in life. The pattern of fine striolation on the second gastric (second postpetiolar) segment varies widely in direction even in uninidal series. Occipital lobe or flange seen from the side narrowly rounded, forming a near right angle, as contrasted with the more broadly rounded and lower flange of *purpurea*; there is, however, some slight variation in the flange of *chalybaea*, and rare specimens isolated from their nest series may approach the condition seen in *pur-*

*purea*. Seen from the side, the anterior and dorsal faces of the petiolar node usually meet in a blunt angle, though here again occasional specimens may approach the more sharply angulate condition of *purpurea*. In differentiating from the very similar-appearing *purpurea*, fresh series are most easily told by the different coloration and the lateral occipital lobe conformation. Even old cabinet specimens are readily separable when one gets an eye for these characters.

Emery (1912, *loc. cit.*) demonstrated the true relationship of Forel's *cyrus*, originally falsely compared, but he did not carry his observations to the formal synonymy they indicate. From Emery's remarks, it appears that the *cyrus* cotype he had from Forel was only a small worker of *chalybaca* with the usual characteristics of such specimens. A cotype of Crawley's variety *scabrior* in the Museum of Comparative Zoology agrees well with the remainder of the *chalybaca* series at my disposal; Crawley knew this group so poorly that he attached his variety to an entirely different species with similar coloration, *R. aspera* (Roger), which is discussed farther below.

Localities for material in Museum of Comparative Zoology: VICTORIA: Ferntree Gully, under stones (C. Barrett, W. Brown). Slope of Warburton Range immediately above Warburton, ca. 400 M., tree-fern gully remnant, in rotten log (Brown). Millgrove, in rotten logs (F. E. Wilson, Brown). NEW SOUTH WALES: Kurrajong (W. W. Froggatt). National Park (W. M. Wheeler, A. M. Lea). Lismore; Armidale (C. F. Deuquet). Coff's Harbour, tree-fern gully near coast, rotten log (Brown). Hornsby; Sutherland (Wheeler). Dorrigo (W. Heron). QUEENSLAND: National Park, MacPherson Range (H. Hacker). Toowong (Wheeler). "Brisbane" (Wheeler). Stanthorpe (E. Sutton). Tambourine Mt., rotten logs in rainforest, ca. 400 M.; Montville, Blackall Range, ca. 500 M., under stones on ridge top, grassy cleared rainforest area (Brown). Winged forms are in the nest in September and October in Victoria, in May in the Blackall Range.

#### RHYTIDOPONERA IMPRESSA (Mayr)

*Ectatomma impressum* Mayr, 1876, Jour. Mus. Godeffroy, 12: 92, worker, female. Type locality: Gayndah, Queensland.

*Rhytidoponera* (*Chalcoponera*) *impressa*, Emery, 1912, Deutsch. ent. Zeitschr., p. 77, worker, in key.

When fully colored, this distinctive species is deep reddish brown to chocolate brown, with conspicuous light reddish-feruginous legs and antennae; a faint trace of coppery reflection may occasionally be present on the dorsal surfaces of the body, but this is negligible in the material I have seen. I can find no other characteristics but the general body color to distinguish this form from *chalybaca* (*q.v.*). The color and the rectangularly rounded lateral occipital lobe in lateral view will serve to separate *impressa* from *purpurea*, even where the two forms occur only a few miles apart at Millaa Millaa and Malanda on the Atherton Tableland. During several days' collecting at Malanda, I found only *purpurea* there, whereas at Millaa Millaa, which has not been systematically collected for the genus, only *impressa* has so far been found.

The Millaa Millaa series was taken by P. J. Darlington, while all of my own collections were made in rainforest on the slopes and at the foot of the Blackall Range, where this species is common in rotten logs and sticks lying on the forest floor, often in exceedingly dense shade. At Kondalilla Falls and along the Obi-Obi River, I found something like twenty nests of *impressa*, about half of which had numerous males and females together in the winged condition and mostly fully colored (May, 1951). Dealate nest queens were found easily in most colonies opened, one to a colony. No single isolated females were found during this period.

Probably Brisbane is just about at the southern limit of this species, which must occur in most suitable rainforest patches and perhaps also in gallery forest along almost the whole of the east Queensland "wet strip" to as far north as the southern edge of the Atherton Tableland. Millaa Millaa is about 2500 feet (760 M.) above sea level, and is rainforest country on rich volcanic soil, much of which has been cleared to grassland for grazing. Malanda, a little farther north and occupied by *R. purpurea*, is similar country lying at an altitude of about 2400 feet. No barriers of any consequence fall between the two localities.

## RHYTIDOPONERA PURPUREA (Emery). New status

*Ectatomma impressum* var. *purpureum* Emery, 1887, Ann. Mus. Civ. Stor. Nat. Genova, (2) 5: 444, worker, female. Type locality: Hatam, New Guinea (Beccari).

*Ectatomma* (*Rhytidoponera*) *impressum* var. *splendidum* Forel, 1910, Rev. Suisse Zool., 18: 12, worker. Type locality: Kuranda, near Cairns, Queensland (R. Turner). **New Synonymy.**

This species differs from *R. chalybaca*, to which it is at first sight very similar, in the very narrow, broadly rounded lateral occipital flange or lobe as seen in lateral view. The difference is slight, and can best be appreciated through comparison of series of both forms. The angle between the anterior and dorsal faces of the petiolar node is usually well-marked, and even sharp, but there is enough variation in this character among all *impressa* group species to render it of little discriminatory value.

The color of the head and alitrunk varies somewhat by nest series, but in fresh specimens is basically a rich, slightly reddish purple, usually with elusive greenish or bluish highlights. The gaster has a slightly contrasting metallic coloration of a predominantly bluish-green hue, often somewhat dull compared to the purple of head and alitrunk; the gastric color seems constant and affords a good distinguishing character even in most old cabinet specimens. The legs and antennae are considerably darker than in *chalybaca*, and appear more nearly black, especially to the naked eye in living specimens, though tending to fade to light brownish in old cabinet specimens: the size averages slightly larger.

The above description is taken from long series of specimens obtained at Kuranda, Queensland, in rotten logs in rainforest by myself, as well as from older series from the same locality taken by Wheeler and T. Greaves, and from the Cairns district by F. P. Dodd. The species is also common along the Black Mountain logging road, on the western side of the MacAlister Range north of Kuranda. I found it somewhat less common at Malanda, in rainforest at 2400 feet (730 M.) altitude on the Atherton Tableland, also in rotten logs, although one isolated nest-founding female was taken here in the "peat" about the base of an epiphytic fern growing on the trunk of a rainforest tree about seven feet above the ground. I visited these localities

during October and the beginning of November, 1950, which is at the end of the dry season in this district. During this time, many dealate females were found isolated with small larval broods, and others were found as queens of established nests, but no winged forms or sexual pupae in obvious stages were seen; Wheeler, however, took the winged forms at Kuranda in October.

I have seen one specimen from New Guinea, collected in the Rawlinson Mountains and sent by Dr. H. Kutter under the name "*var. purpurea* Emery." While an old and somewhat discolored specimen, this example does not seem to possess any notable features by which it can be separated from the Kuranda series of *splendida*. I am expressing this lack of difference by synonymizing Forel's variety, but I hope that a future study of further New Guinea material will test the synonymy thoroughly. *R. purpurea* should be expected to occur in the scattered rainforest patches following the mountains up the eastern side of Cape York Peninsula.

#### GROUP METALLICA

The group of species related to *R. metallica* (Fred. Smith) is in considerable taxonomic confusion, due chiefly to the high degree of geographic variability shown by *R. metallica* itself over a wide range and to the circumstance that certain very similar species have been included in *metallica* as varieties. Most of the forms have been described two or three times under different names and with the briefest and often most irrelevant of characterizations. Such descriptions, which variety-describers considered it their privilege to publish in keeping with the humble status of the variety, are the bane of ant taxonomy, and they show little reflection of the true taxonomic situation. During the 1930's, Clark added to the complications afflicting this group by describing a number of doubtful species based chiefly on variable characters, such as color of metallescence, but apparently without considering sufficiently the degree of variation even in his limited series. In a subsequent paper, I shall try to unravel some of the more difficult complexes in this group to the extent of the material currently available to me, but at this time I am ready to deal with two of the less common species with relatively uncomplicated and obvious synonymy and relationships.



The *metallica* group species are among the smallest *Rhytidoponera*, and are distinguished by having an evenly convex alitruncal profile and prominent posterolateral occipital lobes, or "ears," which often cause the occipital border to be broadly and rather deeply excavate as seen from direct dorsal cephalic view. Coloration is often brilliantly metallic blue, green or purple, but some species lack metallescence completely, and in others it is very variable. Antennal scrobes are lacking or merely suggested, and are not ever so strong as in the *victoriae* complex; however, the *victoriae* complex is hardly more than a subgroup of the *metallica* group. The petiolar node is thick but erect, with steep anterior and posterior faces. The treatments of *R. aspera* and *R. croesus* do not require further general comment.

#### RHYTIDOPONERA ASPERA (Roger)

*Ponera metallica* var. *aspera* Roger, 1860, Berlin. ent. Zeitschr., **4**: 308, worker. Type locality: Australia.

*Rhytidoponera* (*Chalcoponera*) *aspera*, Emery, 1912, Deutsch. ent. Zeitschr., p. 77, worker, in key.

*Rhytidoponera* (*Chalcoponera*) *arnoldi* Forel, 1915, Arkiv. f. Zool., **9** (16): 14, worker. Type locality: Healesville, Victoria (H. A. Arnold). **New**

#### **Synonymy.**

This ant is similar to *metallica*, but is larger and stouter, and is of a brilliant metallic green color (blue or purplish in some old dried specimens) with contrasting reddish ferruginous legs, antennae and mandibles. The second gastric (second postpetiolar) segment is largely smooth and shining, but has some fine, superficial, diverging oblique striae anteriorly, mainly toward the sides above. Forel's characterization of *arnoldi* fits very well with the specimens at hand, and these in turn agree with the essentials of Roger's description. Fortunately, the color, size and details of gastric sculpture leave very little doubt about the identity of this species and its synonym, as it is the only species combining all these characteristics in its genus.

This species is not common in collections, I find, and I have myself met with it only once in the field, at Upper Ferntree Gully Station, Victoria, where strays were found running up the trunk of a large manna gum by the station driveway. These workers were very conspicuous, but I did not succeed in finding the nest,

nor did I see them at the same place on other visits. Small series or strays have also come to me from various Victorian localities: Portland (H. W. Davey); Belgrave (F. E. Wilson); Melbourne (?) (H. Edwards), and I have a pin labelled "Fernshaw," a locality unknown to me and possibly outside Victoria. A single dealate queen was found on the same pin with two *R. chalybaea* dealates, collected by H. Hacker at National Park, MacPherson Ranges, in southeastern Queensland. If this record is correct, the species must range through the moister districts of eastern New South Wales, though no records are available from that state. The locality records indicate a habitat in eucalypt forest of the intermediate to high rainfall types. I have seen a single specimen collected at Auckland, New Zealand, from poles originating at an unknown Australian port, but the species appears not to have colonized New Zealand.

#### RHYTIDOPONERA CROESUS Emery

*Rhytidoponera croesus* Emery, 1901, Ann. Ent. Soc. Belg., **45**: 50, worker.

Type locality: New South Wales.

*Rhytidoponera* (*Chalcoponera*) *croesus* Emery, 1912, Deutsch. ent. Zeitschr., pp. 77, in key, and 81, worker.

*Rhytidoponera* (*Chalcoponera*) *fastuosa* Santschi, 1916, Bull. Soc. ent. France, p. 174, all castes. Type locality: Australia (Duchaussoy), probably New South Wales. **New Synonymy.**

*Chalcoponera victoria* (*sic*) var. *andrei* Wheeler and Chapman, 1925, Philippine Jour. Sci., **28**: 60, worker. Type locality: cited in error as from the mountains of Victoria; *recte* Dorrigo, New South Wales (W. Heron). **New Synonymy.**

*R. croesus* workers and females are recognizable by means of the low, thick, anteriorly rounded petiolar node, the posterodorsal border of which slightly overhangs the posterior face. The color is also distinctive, being basically bright ferruginous, but overlain more or less completely and heavily with deep, brilliant purple metallescence. In the extreme form, represented by what Santschi described as *fastuosa*, most of the head, alitrunk, petiole and gaster is densely purple in color, whereas intermediates like the types of the original *croesus* may have only the alitrunk thoroughly saturated with purple, while the head, the gaster, or both remain more or less pure ferruginous like the appendages. Single nests, excepting teneral, are usually fairly uniform

through the series, but a collection containing series from several nests shows all degrees of intergradation, even from close localities within the restricted distribution in eastern New South Wales and southeastern Queensland. Santachi's description is confused by his comparison with *croesus*, which species he credits to Forel as author. It seems that his comparison is really made against *cyrus* Forel (*chalybaea* Emery, see above), and in this connection his description makes more sense. The variety *andrei* was described due to a highly improbable series of errors, involving mislabelling of the specimens and misreading even of these labels. Dr. J. W. Chapman has reviewed this situation and produced three worker cotypes. These are faded purple specimens, and their character and kind of mounting shows that they are part of an old series Wheeler had received from Dorrigo, New South Wales, from W. Heron, the collector. "*Victoriae*" of someone's temporary label was misread as "*Victoria*," but no specimens of this species have yet been recorded from Victoria. The supposed introduction into Luzon must also be regarded as a doubtful record, since the relevant specimen is apparently missing.

Material in Museum of Comparative Zoology: from eastern New South Wales: Bulli Pass (W. M. Wheeler). Dorrigo (W. Heron). Lismore (C. F. Deuquet). Queensland: Tambourine Mt. (A. M. Lea; Brown) running on rotten tree trunk in dense rainforest at 1100 feet. Stanthorpe (E. Sutton). National Park, MacPherson Range (H. Hacker). *R. croesus* is apparently restricted to the wet subtropical forests of eastern New South Wales and extreme southeastern Queensland.